



۲. آزمون محاسباتی

آزمون محاسباتی گروه ریاضی

$$f(u) = \sqrt{u+4} \sqrt{u-4} + 4 - 4 = \sqrt{(\sqrt{u-4}+2)^2} \quad -1$$

$$g(u) = \sqrt{(\sqrt{u-4}-2)^2} \xrightarrow{u \geq 4} f(u) + g(u) = \sqrt{u-4} + 2 + \sqrt{u-4} - 2 = 2\sqrt{u-4} \rightarrow a=0 \quad b=2 \quad c=-4$$

$$\rightarrow \frac{a+b}{c} = \frac{2}{-4} = -\frac{1}{2} \quad \text{پ}$$

$$f(u) = \frac{u+2}{(u-1)(u-3)} \rightarrow D_f = \mathbb{R} - \{1, 3\} \quad -2 \quad \text{پ}$$

$$f(2) = -4 \quad f(0) = \frac{2}{3} \rightarrow \left(\frac{g}{f} = f\left(2, -\frac{1}{4}\right), (0, \frac{3}{2}) \right)$$

$$\text{الف)} f(2u) = f\left(\frac{1}{2}, 2\right), \left(\frac{3}{2}, -1\right), (2, 2), \left(-\frac{1}{2}, 4\right) \quad -3$$

$$\text{ب)} f(u) = f(1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2)$$

$$\text{ج)} 2g(u) + 1 = f(-2, 19), (1, 3), (3, 9), (-1, 1)$$

$$\text{د)} f(1, -4), (3, -1) \quad \text{پ}$$

$$h = f(2, 5), (3, 5), (-2, 4) \quad -4 \quad \text{پ}$$

$$f(u) \rightarrow 2u \geq 0 \rightarrow u \geq 0 \quad \sqrt{2u} \geq u \rightarrow u^2 - 2u \leq 0 \rightarrow 0 \leq u \leq 2 \quad -5$$

$$D_f = [0, 2] - \{2\}$$

$$\left(\frac{f}{g+1}\right)(u) \rightarrow g(u) \neq -1 \rightarrow u \in \mathbb{Z} \rightarrow D = \{0, 1, 3\} \quad \text{پ}$$

$$f(u) = \sqrt{-(u-1)(u-4)} \rightarrow D_f = [1, 4]$$

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$$h(u) = \left\{ (1, 0), \left(2, \frac{\sqrt{3}}{2}\right), (4, 0) \right\}$$

$$\text{الف) } y = (u-1)^3 + 1 \rightarrow (u-1)^3 = y-1 \rightarrow u-1 = \sqrt[3]{y-1} \\ \rightarrow u = \sqrt[3]{y-1} + 1 \rightarrow R = \mathbb{R}$$

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$$\text{ب) } y^2 - 2yu + 1 = 0 \rightarrow y^2 - 2yu + 1 = 0 \rightarrow \Delta = 4y^2 - 4y$$

$$u = \frac{2y \pm \sqrt{4y^2 - 4y}}{2y} \rightarrow 4y(y-1) \geq 0 \rightarrow \frac{-1 \pm \sqrt{1-4y}}{2} \rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$$

$$\text{الف) } u_{\min} = \frac{-b}{2a} = 2 \quad y_{\min} = 1 - 1 + 1 = 1 \quad R = [1, +\infty)$$

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$$\text{ب) } u_{\max} = \frac{-4}{-2} = 2 \quad y_{\max} = 4 + 1 + 1 = 6 \quad R = (-\infty, 6]$$

$$\text{ج) } u_{\min} = 2 \quad y_{\min} = 1 - 1 + 1 = 1 \quad R = \sqrt{[-1, +\infty)} = [0, +\infty)$$

$$\text{د) } u_{\max} = 2 \quad y_{\max} = 1 \quad R = \sqrt{(-\infty, 1]} = [0, 1]$$

$$\text{الف) } R_f = \mathbb{R}$$

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$$\text{ب) } R_f = \mathbb{R}$$

$$\text{ج) } R_f = \sqrt{\mathbb{R}} = [0, +\infty)$$

$$\text{د) } R_f = \mathbb{R}^+ = [0, +\infty)$$

الف $\frac{a}{c} = 3$ $R_f = \cancel{A} - \{3\}$

ب $\frac{a}{c} = 2$ $R_f = \cancel{A} - \{2\}$

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